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NASA-TLX Mental Workload Analysis of Agrarian Reform Access Field Staff at Kantor Pertanahan X

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ABSTRACT

Agrarian Reform Access activities require field staff to integrate field and administrative responsibilities, including data collection, field verification, community coordination, data processing, mentoring, and report preparation. In public land administration, this integrated role requires a workload evaluation approach that can describe both the overall workload level and its dominant dimensions. This study applied the NASA Task Load Index (NASA-TLX) as a practical diagnostic method to assess the perceived mental workload of field staff at Kantor Pertanahan X and to formulate dimension-based improvement directions. A descriptive quantitative survey was conducted using a total sampling of all eight field staff members. The results showed an average NASA-TLX score of 89.88, indicating a high level of perceived mental workload; all respondents were classified in the high workload category, with scores ranging from 82.00 to 99.33. The dominant dimensions were Performance, Mental Demand, and Effort, suggesting that respondents perceived their workload most prominently in relation to program target achievement, cognitive processing of field and administrative data, and the effort required to complete interconnected tasks. These findings should be interpreted as descriptive perceived workload patterns rather than causal relationships. Compared with general workload evaluation approaches, NASA-TLX offers the advantage of identifying both aggregate workload and dimension-level profiles. The findings support targeted improvements in task distribution, work scheduling, reporting formats, technical support, and internal coordination in Agrarian Reform Access activities.

1. Introduction

The increasing complexity of work demands in various organizations requires appropriate human resource management, particularly in workforce allocation, task distribution, and workload suitability. An imbalance between workload and worker capacity may be associated with reduced work effectiveness, lower quality of work outcomes, and unfavorable worker conditions. Therefore, workload measurement is important as a basis for evaluating work systems and determining proportional workforce needs. Bakhtiar *et al.* [1] found that inappropriate worker placement at Toko Daffa was related to ineffective employee performance and service queues. Yanti *et al.* [2] showed that excessive workload at UD Budi Ayu was associated with workers' physical condition and work quality if no improvement was implemented. Krisjayanti *et al.* [3] also reported that high work demand combined with limited human resources in a jenang-producing MSME indicated excessive workload and required recommendations for additional workers.

In the public sector, workload management is also important because the success of government programs depends greatly on the readiness and performance of field-level personnel. One of Indonesia's strategic government programs is Agrarian Reform, which aims to address inequality in the control,

ownership, use, and utilization of land and natural resources. The implementation of Agrarian Reform is not limited to asset structuring but also includes Agrarian Reform Access, which focuses on community empowerment, institutional strengthening, business development, and economic access facilitation for Agrarian Reform beneficiaries. In practice, Agrarian Reform Access activities involve field staff or supporting personnel at Kantor Pertanahan in various regions. These personnel play an important role in supporting technical and administrative activities, including data collection, field verification, coordination with communities, mentoring, data processing, and report preparation.

At the local level, field staff involved in Agrarian Reform Access activities at Kantor Pertanahan X have direct responsibility for supporting program implementation in the field. Their work is not limited to administrative tasks but also requires mobility, accuracy, concentration, communication skills, and the ability to adapt to community conditions and field environments. This complexity may be associated with a high level of perceived mental workload, particularly when field activities, coordination, data processing, and report preparation must be completed simultaneously within a limited time frame. Ali *et al.* [4] showed that work involving concentration, accuracy, and responsibility is relevant to employees' mental workload. Pasaribu and Nugraha [5] found that high mental workload was associated with work performance and worker frustration. In addition to cognitive and administrative demands, the physical work environment may also be related to workers' workload and performance. Taufiq *et al.* [6] examined vibration exposure among workers in a fertilizer factory and found that an unfavorable physical work environment was associated with worker comfort, safety, and musculoskeletal complaints. Although the occupational context differs from Agrarian Reform Access activities, this finding remains relevant because field staff are required to work in varying field environments where mobility, accessibility, physical conditions, and situational demands may be related to overall workload.

One widely used method for assessing perceived mental workload is the NASA Task Load Index, commonly known as NASA-TLX. Hardy and Hinkin [7] stated that NASA-TLX is a standard instrument in human factors and neuroergonomics research for assessing perceived workload across different task conditions. Hutson *et al.* [8] further demonstrated that NASA-TLX can be applied as a valid and reliable instrument for measuring perceived cognitive load when questionnaire dimensions and administration procedures are clearly defined. These characteristics make NASA-TLX relevant for evaluating the perceived workload profile of Agrarian Reform Access field staff, whose work involves cognitive processing, field mobility, time pressure, performance targets, and administrative accuracy. Putra and Putra [9] applied NASA-TLX to production operators and showed that the method can identify the level of perceived mental workload experienced by workers. Aranda *et al.* [10] used NASA-TLX to analyze the perceived mental workload of printing machine operators and reported that target-based work was associated with perceived mental workload. Anggraini and Pratama [11] applied NASA-TLX to service advisor employees and found that work demands were related to perceived mental workload and effort. Nurriza *et al.* [12] combined NASA-TLX with workload analysis in an industrial work setting and showed that workload measurement can be used to support work scheduling and workforce evaluation. These studies demonstrate that NASA-TLX can be applied in various occupational contexts to assess perceived mental workload and identify dominant workload dimensions.

Previous studies have applied workload analysis in various occupational contexts using different methods, including Full Time Equivalent, Workload Analysis, SNQ, NASA-TLX, and combined workload evaluation approaches. These studies provide empirical evidence that workload measurement can support workforce allocation, identify physical and mental workload conditions, evaluate work schedules, and formulate improvement recommendations. However, the application of NASA-TLX in the context of public sector fieldwork, particularly for field staff involved in Agrarian Reform Access activities, has not been widely examined. Therefore, a comparison between previous studies and the present study is provided to highlight the research gap, methodological relevance, and novelty of this

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study. The comparison focuses on the research context, method, main focus, and relevance of each previous study to the current research, as presented in Table 1.

Table 1. Comparison of Previous Studies and Current Research

Author(s)	Research Context	Method	Main Focus	Relevance to Current Study
Bakhtiar *et al.* [1]	Retail and wholesale workers	Full-time Equivalent and Workload Analysis	Workforce allocation and workload balance	Supports workload measurement for workforce evaluation
Yanti *et al.* [2]	Small manufacturing industry	Workload Analysis and SNQ	Workload and physical complaints	Shows the relevance of workload evaluation for worker conditions and work quality
Krisjayanti *et al.* [3]	MSME food production	Workload Analysis	Workload and labor requirements	Supports workload-based workforce planning
Ali *et al.* [4]	Warehouse staff	NASA-TLX	Perceived mental workload assessment	Relevant to work requiring accuracy, concentration, and responsibility
Pasaribu and Nugraha [5]	Telecommunication company employees	NASA-TLX	Perceived mental workload identification	Supports the use of NASA-TLX for identifying perceived mental workload
Putra and Putra [9]	Production operators	NASA-TLX	Perceived mental workload level	Supports the use of NASA-TLX for perceived workload measurement
Aranda *et al.* [10]	Printing machine operators	NASA-TLX	Target-based perceived mental workload	Relevant to target-based work settings requiring high concentration
Anggraini and Pratama [11]	Service advisor employees	NASA-TLX	Perceived mental workload and effort	Relevant to service-oriented work settings involving perceived workload and effort
Nurriza *et al.* [12]	Industrial workstation	NASA-TLX and FTE	Workload evaluation and work scheduling	Supports workload evaluation for improvement recommendations
Current study	Agrarian Reform Access field staff	NASA-TLX	Perceived mental workload and dominant workload dimensions	Provides dimension-based evidence of perceived workload in the Agrarian Reform Access fieldwork within public land administration

As presented in Table 1, previous studies have established important empirical and methodological foundations for workload analysis in various occupational contexts. Several studies have also applied NASA-TLX to assess perceived mental workload levels and identify dominant workload dimensions in target-based and service-oriented work settings. However, the research gap in this study does not lie merely in the absence of the NASA-TLX application in a different occupational setting. Rather, it lies in the limited empirical understanding of how perceived mental workload dimensions are reflected in public land administration fieldwork, particularly in Agrarian Reform Access activities. In this context, field staff are required to perform interconnected duties involving field verification, community coordination, land-related data validation, mentoring, data processing, formal reporting, and program target achievement. Although some of these workload characteristics may also appear in other occupations, their simultaneous occurrence within a government program implementation setting

creates a specific workload configuration that has not been sufficiently examined in previous workload studies. Unlike routine target-based or service-oriented jobs, Agrarian Reform Access fieldwork combines administrative accountability, field mobility, community engagement, cognitive processing, time constraints, and formal public-sector reporting within a single work role. Therefore, this study contributes by providing empirical evidence on the perceived workload profile of Agrarian Reform Access field staff and by linking dominant NASA-TLX dimensions to context-specific work improvement needs.

In line with this research gap, this study aims to assess the perceived mental workload of field staff involved in Agrarian Reform Access activities at Kantor Pertanahan X using the NASA-TLX method. Specifically, this study seeks to determine the overall level of perceived mental workload, identify the dominant NASA-TLX dimensions that characterize the workload profile, and formulate dimension-based improvement recommendations that are relevant to the work characteristics of Agrarian Reform Access field staff. The rationale for this study is that NASA-TLX provides not only an overall workload score but also a diagnostic profile of workload dimensions, allowing the findings to be interpreted in relation to specific work demands rather than only as a general workload category. By focusing on the interaction between NASA-TLX dimensions and the specific characteristics of public land administration fieldwork, this study is expected to contribute to a more contextualized understanding of perceived mental workload in government program implementation. The findings may also provide practical input for improving task distribution, work scheduling, reporting mechanisms, technical support, and internal coordination in Agrarian Reform Access activities.

2. Methods

This study employed a descriptive quantitative design with a survey approach to assess the perceived mental workload of field staff involved in Agrarian Reform Access activities at Kantor Pertanahan X. This design was selected because the study aimed to describe the workload profile of a specific field staff group within the context of public land administration fieldwork. The research variable was perceived mental workload, measured using the NASA Task Load Index (NASA-TLX) through six dimensions: Mental Demand (MD), Physical Demand (PD), Temporal Demand (TD), Performance (P), Effort (E), and Frustration Level (FL). NASA-TLX was selected because previous studies have shown its suitability for assessing perceived mental workload in various occupational contexts, particularly work settings involving accuracy, responsibility, coordination, time pressure, and workload evaluation. Ali *et al.* [4] applied NASA-TLX to warehouse staff and showed that the method can identify perceived mental workload levels in jobs requiring accuracy and responsibility. Pasaribu and Nugraha [5] used NASA-TLX to identify perceived mental workload among employees in a telecommunication company. Putra and Putra [9] applied NASA-TLX to production operators and demonstrated its usefulness in evaluating perceived mental workload levels. Nurriza *et al.* [12] combined NASA-TLX with workload analysis to support work scheduling and workforce evaluation in an industrial workstation.

The population of this study consisted of all field staff involved in Agrarian Reform Access activities at Kantor Pertanahan X, totaling eight field staff members. Because the population was limited and all members were accessible, this study used a total sampling approach, in which all eight field staff members were included as respondents. This approach was considered appropriate for the descriptive scope of the study, which aimed to examine the perceived workload profile of the entire field staff group at Kantor Pertanahan X. Nevertheless, the limited number of respondents is acknowledged as a methodological limitation. Although NASA-TLX can be applied in small-group studies, the sample size in this study restricts the generalizability of the findings beyond the observed organizational context. Accordingly, the results should be interpreted as a contextual description of perceived mental workload among field staff at Kantor Pertanahan X rather than as findings intended to represent all Agrarian Reform Access field staff in other regions.

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Data were collected using NASA-TLX rating and weighting questionnaires. The questionnaire followed the standard NASA-TLX dimensions and item structure. The wording of the items was retained to preserve consistency with the original NASA-TLX instrument, while contextual relevance was ensured through instructions directing respondents to answer based on their experience in carrying out Agrarian Reform Access activities. These activities included field verification, community coordination, data processing, mentoring, and report preparation. Thus, contextualization was applied through response instructions rather than by changing the NASA-TLX item wording. Hutson *et al.* [8] emphasized that NASA-TLX administration and item clarity are important for obtaining valid and reliable workload measurements. Hardy and Hinkin [7] also showed that NASA-TLX can be used to assess subjective workload when the dimensions are presented clearly to respondents. The overall research procedure is presented in Figure 1.

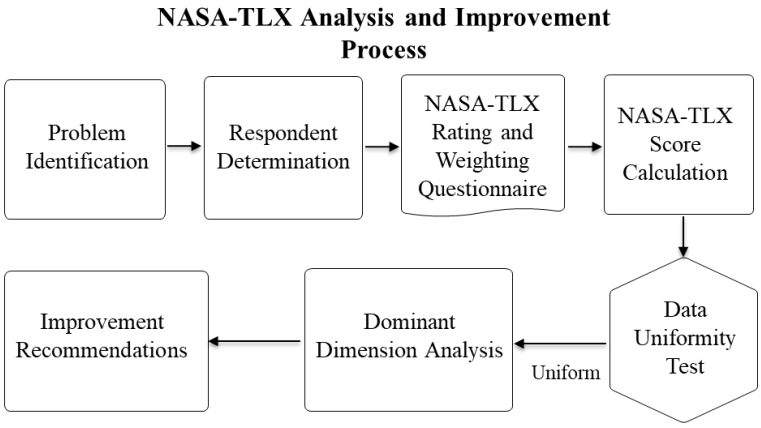

Figure 1. Research Procedure

Figure 1 illustrates the overall research procedure used in this study. The process began with problem identification and respondent determination, followed by data collection using NASA-TLX rating and weighting questionnaires. The collected data were then processed to calculate the NASA-TLX score for each respondent. After the scores were obtained, a data uniformity test was conducted to examine whether the NASA-TLX scores were within acceptable control limits. This test was used to identify whether the respondents' NASA-TLX scores showed acceptable variation and whether any score fell outside the control range. The analysis then proceeded to workload category interpretation, dominant dimension identification, and the formulation of dimension-based improvement recommendations.

Table 2. NASA-TLX Rating Questionnaire

Dimension	Question	Scale
Mental Demand (MD)	How much mental activity was required, such as thinking, deciding, calculating, remembering, observing, and searching for information?	0-100
Physical Demand (PD)	How much physical activity was required to complete the work?	0-100
Temporal Demand (TD)	How much time pressure was felt during task completion?	0-100
Performance (P)	How successful were you in achieving the work target, and how satisfied were you with your performance?	0-100
Effort (E)	How much mental and physical effort was required to achieve the expected performance?	0-100
Frustration Level (FL)	How much anxiety, pressure, stress, or frustration was experienced while performing the work?	0-100

The rating questionnaire followed the standard NASA-TLX dimensions and item structure. Respondents assigned scores from 0 to 100 to the six NASA-TLX dimensions based on their perceived workload during Agrarian Reform Access activities, with higher scores indicating higher perceived

workload. This approach allowed for a quantitative assessment of workload across different cognitive and physical aspects of the task. Consequently, the collected ratings provided a multidimensional profile of workload rather than a single overall score. Moreover, using the same 0–100 scale across all dimensions ensured consistency in responses and facilitated descriptive comparison among the six workload components. The NASA-TLX rating questionnaire used in this study is presented in Table 2. Similarly, the weighting questionnaire followed the standard NASA-TLX pairwise comparison structure. The NASA-TLX pairwise weighting questionnaire used in this study is presented in Table 3.

Table 3. NASA-TLX Pairwise Weighting Questionnaire

No.	Pairwise Comparison		
1.	Mental Demand (MD)	or	Physical Demand (PD)
2.	Mental Demand (MD)	or	Temporal Demand (TD)
3.	Mental Demand (MD)	or	Performance (P)
4.	Mental Demand (MD)	or	Effort (E)
5.	Mental Demand (MD)	or	Frustration Level (FL)
6.	Physical Demand (PD)	or	Temporal Demand (TD)
7.	Physical Demand (PD)	or	Performance (P)
8.	Physical Demand (PD)	or	Effort (E)
9.	Physical Demand (PD)	or	Frustration Level (FL)
10.	Temporal Demand (TD)	or	Performance (P)
11.	Temporal Demand (TD)	or	Effort (E)
12.	Temporal Demand (TD)	or	Frustration Level (FL)
13.	Performance (P)	or	Effort (E)
14.	Performance (P)	or	Frustration Level (FL)
15.	Effort (E)	or	Frustration Level (FL)

The data analysis was conducted in several stages to ensure that the collected data could be evaluated transparently and replicated by future researchers. First, the NASA-TLX score for each respondent was calculated by multiplying the rating and weight of each dimension, as shown in (1). The product value of each dimension represents the weighted value of that dimension in the respondent's perceived workload score.

$$\text{Product}_i = \text{Rating}_i \text{ x } \text{Weight}_i \quad (1)$$

where $Product_i$ is the product value of the dimension i, $Rating_i$ is the rating score of the dimension i, and $Weight_i$ is the weight obtained from the pairwise comparison. The Weighted Workload (WWL) was then calculated by summing the product values of all six dimensions, as shown in (2).

$$\text{WWL} = \sum_{i=1}^{6} \text{Product}_i \quad (2)$$

The final NASA-TLX score was obtained by dividing the WWL by 15, which represents the total number of pairwise comparisons in the weighting stage, as shown in (3).

$$\text{NASA} - \text{TLX Score} = \frac{\text{WWL}}{15} \quad (3)$$

The score was interpreted using the workload categories shown in Table 4.

Table 4. Interpretation of NASA-TLX Scores

Score	Category
< 50	Low
50 - 80	Moderate
> 80	High

As shown in Table 4, a NASA-TLX score below 50 indicates a low perceived mental workload, a score between 50 and 80 indicates a moderate perceived mental workload, and a score above 80 indicates a high perceived mental workload. This classification was used to interpret the average NASA-TLX

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score of field staff and to determine the overall perceived workload category in the results and discussion section.

After the NASA-TLX scores for all respondents were obtained, a data uniformity test was conducted to examine whether the scores were within acceptable control limits. This test was intended to identify whether the collected scores showed acceptable variation and whether any value fell outside the control range. The mean score and standard deviation were calculated using (4) and (5), respectively.

$$\bar{X} = \frac{\Sigma X}{N} \tag{4}$$

$$\sigma = \sqrt{\frac{\Sigma(X-\bar{X})^2}{N-1}} \tag{5}$$

The Upper Control Limit (UCL) and Lower Control Limit (LCL) were calculated using (6) and (7).

$$UCL = \bar{X} + k\sigma \tag{6}$$

$$LCL = \bar{X} - k\sigma \tag{7}$$

where $\bar{X}$ is the mean NASA-TLX score, σ is the standard deviation, UCL is the upper control limit, LCL is the lower control limit, and k is the confidence level coefficient. The data were considered uniform when all NASA-TLX scores were within the range $LCL \leq X \leq UCL$.

The final stage was the dominant dimension analysis. This analysis was conducted to identify which NASA-TLX dimension had the largest weighted contribution to the NASA-TLX score. For each dimension, the product values from all respondents were summed, and the average product value was calculated. The percentage contribution of each dimension was then determined by comparing the total product value of that dimension with the total product value of all six dimensions. Aksu et al. [13] showed that NASA-TLX dimensions may have different levels of contribution to overall perceived workload, making dimension-level analysis important for identifying prominent workload dimensions. Therefore, the dominant dimension analysis in this study was used to describe the overall perceived workload profile and to determine which dimension should be prioritized in improvement recommendations. The formulas used for this stage are shown in (8), (9), and (10).

$$\text{Total Product}_j = \sum_{r=1}^{n} \text{Product}_{rj} \tag{8}$$

$$\text{Mean Product}_j = \frac{\text{Total Product}_j}{N} \tag{9}$$

$$\text{Contribution}_j = \frac{\text{Total Product}_j}{\sum_{j=1}^{6} \text{Total Product}_j} \text{ x } 100\% \tag{10}$$

where j represents each NASA-TLX dimension, r represents each respondent, N is the number of respondents, $Product_{rj}$ is the product value of the respondent r for dimension j, $Total\ Product_j$ is the total product value of the dimension j, $Mean\ Product_j$ is the average product value of the dimension j, and $Contribution_j$ is the percentage contribution of the dimension j. The dimension with the highest $Mean\ Product_j$ and $Contribution_j$ was identified as the dominant perceived mental workload dimension.

3. Results and Discussions

This section presents the main findings related to the perceived mental workload level, data uniformity, and dominant NASA-TLX dimensions. Detailed calculations of each NASA-TLX component are summarized to highlight the results most relevant to interpretation and discussion. The perceived mental workload scores of the eight field staff members are presented in Table 5.

Table 5. Summary of NASA-TLX Perceived Mental Workload Scores

Respondent	WWL	NASA-TLX Score	Category
FS1	1390	92.67	High
FS2	1400	93.33	High

Respondent	WWL	NASA-TLX Score	Category
FS3	1355	90.33	High
FS4	1490	99.33	High
FS5	1330	88.67	High
FS6	1290	86.00	High
FS7	1300	86.67	High
FS8	1230	82.00	High
Average		**89.88**	**High**

Based on Table 5, the average NASA-TLX score of the field staff was 89.88, indicating a high perceived mental workload category. The highest score was recorded by FS4 at 99.33, whereas the lowest score was recorded by FS8 at 82.00. Although FS8 obtained the lowest score among the respondents, this value remained within the high workload category. These results indicate that all field staff perceived a substantial level of mental workload during the implementation of Agrarian Reform Access activities.

As NASA-TLX is a subjective workload assessment method, variations in individual scores may be associated with differences in perceived task demands, task responsibility, intensity of field activities, time pressure, work experience, adaptability, and individual interpretation of workload conditions. Barajas-Bustillos *et al.* [14] demonstrated that NASA-TLX is sensitive to respondents' experience in assessing subjective mental workload, suggesting that workers with different levels of task familiarity and exposure may report different workload perceptions. Hernandez *et al.* [15] also showed that NASA-TLX can be adapted to capture workload variations across repeated work measurements, indicating its relevance in work contexts where perceived workload may fluctuate according to task characteristics and individual conditions. Therefore, the variation in NASA-TLX scores among field staff in this study can be interpreted as differences in perceived workload rather than merely numerical variation among respondents. The distribution of NASA-TLX scores is presented in Figure 2. The figure shows that all respondents obtained scores above 80, confirming that the perceived mental workload of the field staff was consistently classified as high.

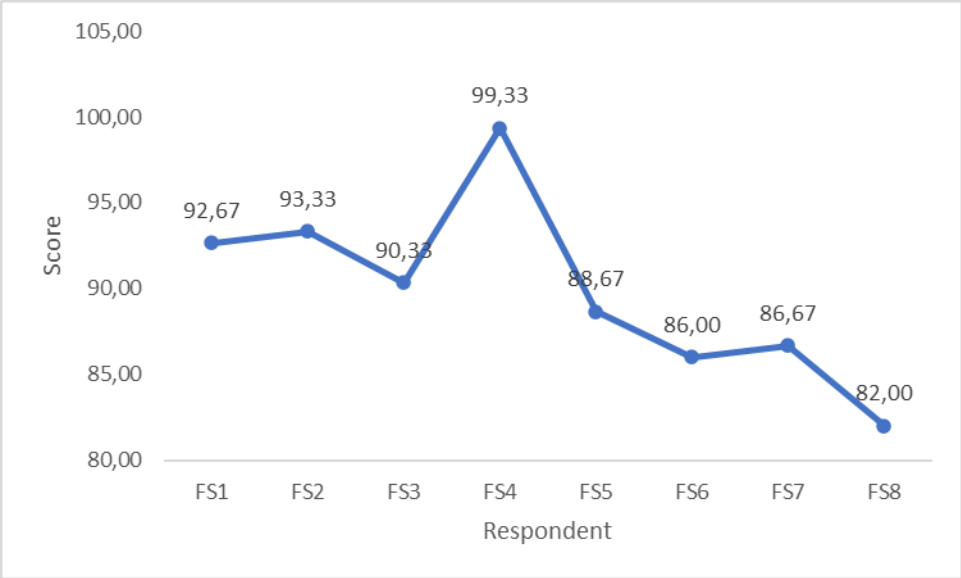

Figure 2. NASA-TLX Perceived Mental Workload Scores of Field Staff

After the NASA-TLX scores were obtained, a data uniformity test was conducted using a 95% confidence level (k = 2) to examine whether the NASA-TLX scores were within acceptable control limits. The test showed an average score of 89.88, a standard deviation of 5.32, an Upper Control Limit (UCL) of 100.52, and a Lower Control Limit (LCL) of 79.23. Although the UCL slightly exceeded the

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maximum possible NASA-TLX score of 100, all observed respondent scores remained within the control limits. This result indicates that no extreme score was identified and that all respondent scores could be retained for further analysis. These results are summarized in Table 6.

Table 6. Results of the Data Uniformity Test

Test Component	Result	Interpretation
Mean score	89.88	-
Standard deviation	5.32	-
UCL	100.52	Upper control limit
LCL	79.23	Lower control limit
Data condition	-	Uniform

As shown in Table 6, all NASA-TLX scores were within the acceptable control limits. The data uniformity test indicated that the variation in respondents' scores remained within the expected range. This procedure is consistent with previous workload studies [2], [3], which applied data checking procedures to examine whether the collected workload data were appropriate for further analysis and interpretation. Figure 3 further shows that all scores were located between the UCL and LCL. FS4, as the highest-scoring respondent, remained below the UCL, while FS8, as the lowest-scoring respondent, remained above the LCL. Therefore, all respondent scores were retained for further analysis.

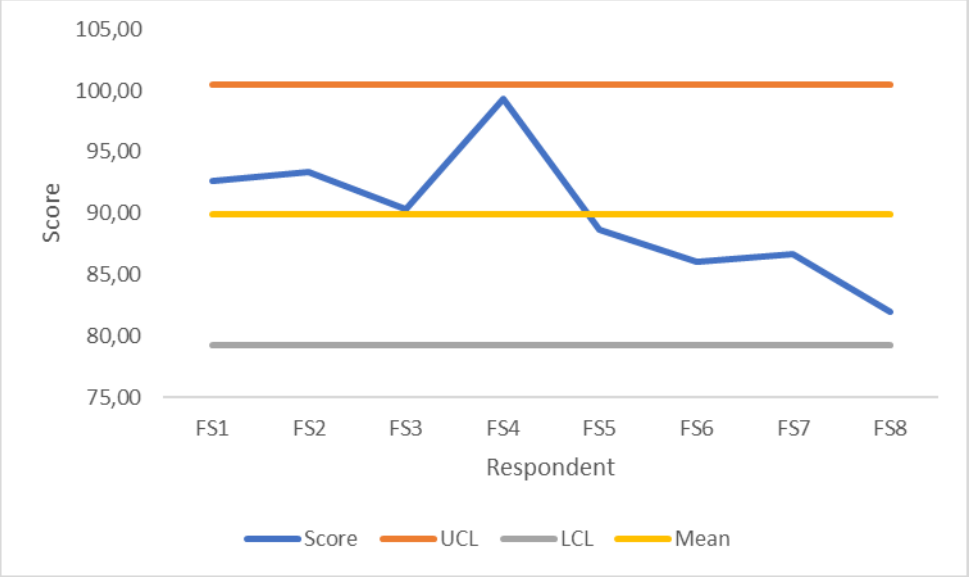

Figure 3. Data Uniformity Graph of NASA-TLX Scores

After the uniformity test, the analysis proceeded by identifying the dominant NASA-TLX dimensions. This step was carried out by summing the product values of each NASA-TLX dimension across all respondents and calculating the average product value and percentage contribution. The results are presented in Table 7.

Table 7. Dominant Perceived Mental Workload Dimensions Based on NASA-TLX

Dimension	Total Product	Average Product	Contribution	Rank
Performance (P)	2720	340.00	25.22%	1
Mental Demand (MD)	2565	320.63	23.78%	2
Effort (E)	2300	287.50	21.33%	3
Temporal Demand (TD)	1640	205.00	15.21%	4
Physical Demand (PD)	1510	188.75	14.00%	5
Frustration Level (FL)	50	6.25	0.46%	6

Table 7 shows that the highest weighted contribution was found in the Performance dimension at 25.22%, followed by Mental Demand at 23.78% and Effort at 21.33%. These findings indicate that

respondents perceived their workload most prominently in relation to work target achievement, cognitive processing and analysis, and the effort required to complete assigned tasks. Therefore, the ranking of dimensions should be interpreted as a descriptive pattern of perceived workload, rather than as evidence of statistically significant differences among dimensions or causal relationships. The percentage contribution of each NASA-TLX dimension is illustrated in Figure 4.

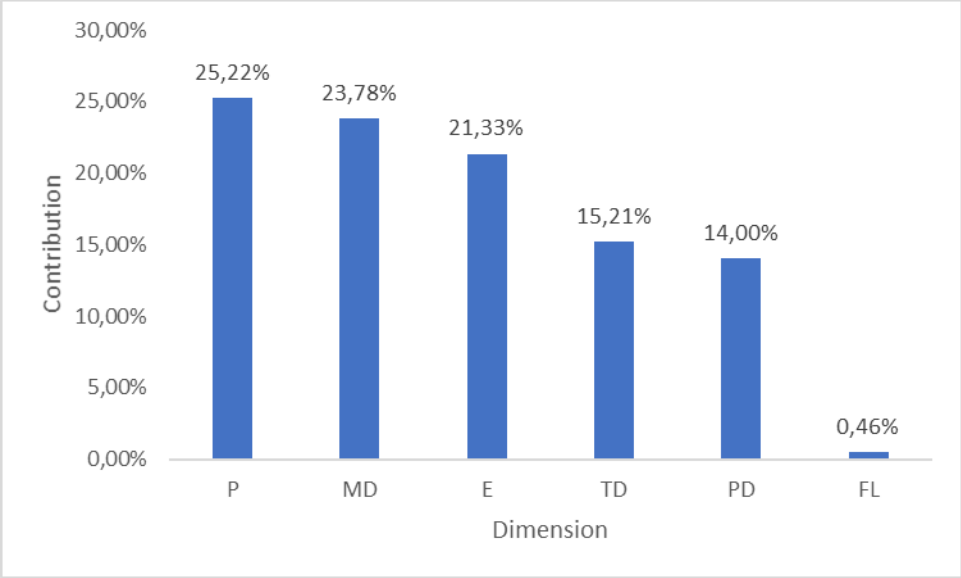

Figure 4. Percentage Contribution of NASA-TLX Dimensions to Field Staff Perceived Mental Workload

The high average NASA-TLX score reflects a high perceived workload profile among field staff involved in Agrarian Reform Access activities. In this context, field staff is not only responsible for administrative tasks but also performs data collection, field verification, coordination with communities and stakeholders, data processing, community assistance, and report preparation. Based on the descriptive NASA-TLX results, the dominant dimensions of Performance, Mental Demand, and Effort suggest that respondents perceived their workload most prominently in relation to formal program target achievement, cognitive processing of field and administrative data, and the effort required to complete interconnected field-based and administrative tasks. This interpretation should be understood as a descriptive pattern of perceived workload rather than as evidence of causal relationships among workload dimensions. Previous studies using NASA-TLX in printing machine operators, service advisor employees, telecommunication employees, and warehouse staff also reported the relevance of target-based work, service demands, performance-related pressure, concentration, accuracy, and responsibility in perceived workload assessment [4], [5], [10], [11]. However, these studies were conducted in different occupational contexts; therefore, they are used as methodological and conceptual comparisons rather than direct contextual equivalents. The present study differs by examining perceived workload in Agrarian Reform Access fieldwork, where administrative accountability, field mobility, community engagement, land-related data validation, formal reporting, and government program targets are integrated within a single work role.

The dominance of the Performance dimension further indicates that field staff perceived substantial workload in relation to target achievement, work quality, and the successful completion of assigned duties. In the context of Agrarian Reform Access activities, this pattern may be related to the requirement to produce accurate data, conduct field verification properly, prepare reports according to established standards, and complete activities in accordance with program targets. Recent studies have emphasized that NASA-TLX dimensions may show different levels of contribution to overall perceived workload; therefore, dimension-level analysis is important for identifying prominent workload dimensions that require managerial attention [13]. In this study, the high contribution of the Performance dimension

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suggests that achievement-oriented demands were prominently reflected in the perceived workload profile of field staff.

In addition to Performance, the second and third dominant dimensions, Mental Demand and Effort, provide further explanation of the perceived workload profile of field staff. The high contribution of Mental Demand indicates that field staff perceived cognitive activities as prominent in their work, including understanding field data, identifying subjects and objects, analyzing regional potential, processing information, and aligning field findings with administrative requirements. This interpretation is supported by Mohammadian et al. [16], who found a significant positive relationship between cognitive demands and mental workload among mining control room operators. Although the work context differs, both studies indicate that tasks involving memory, information processing, and decision-making are often associated with higher perceived mental workload. Meanwhile, the high contribution of Effort suggests that field staff perceived considerable mental and physical effort in achieving the expected level of performance. This finding is consistent with Rahman *et al.* [17], who found that Effort was the most prominent factor in NASA-TLX assessment among electronic installation workers, emphasizing the importance of focus, persistence, and goal achievement in demanding work conditions.

The remaining dimensions, namely Temporal Demand, Physical Demand, and Frustration Level, had lower contributions but still provide important insights into the workload profile of field staff. Temporal Demand, with a contribution of 15.21%, indicates that time pressure was still perceived by respondents, particularly in relation to data collection targets, field schedules, community coordination, and report deadlines. Physical Demand, with a contribution of 14.00%, suggests that mobility and field activities were also reflected in the perceived workload profile, although less prominently than Performance, Mental Demand, and Effort. Nino *et al.* [18] emphasized that mental workload is a multidimensional construct involving task characteristics, individual factors, and the work environment, and that higher perceived mental workload can be associated with adverse body posture responses. This supports the interpretation that the workload experienced by field staff should not be viewed solely as a cognitive issue, but rather as the result of interactions among task complexity, mobility, work environment, and physical activity. Frustration Level had the lowest weighted contribution, at 0.46%, which was notably lower than the contributions of the other NASA-TLX dimensions. This result suggests that respondents did not perceive frustration, stress, or emotional pressure as a prominent workload dimension during Agrarian Reform Access activities. However, this finding should be interpreted cautiously, as it may reflect differences in respondents' interpretation of the Frustration Level dimension, possible response bias, or adaptation to recurring field and administrative work conditions. Therefore, the low Frustration Level score should not be interpreted as the absence of psychological strain, but rather as an indication that emotional pressure was less prominently perceived than Performance, Mental Demand, and Effort in this study.

Overall, the findings show that field staff reported a high level of perceived mental workload, with the most prominent weighted contributions observed in Performance, Mental Demand, and Effort. These results suggest that the perceived workload profile was closely related to work target achievement, cognitive processing, and the effort required to complete interconnected field-based and administrative tasks. In the context of Agrarian Reform Access activities, the Performance dimension can be linked to formal program targets, reporting requirements, and the need to complete field verification and data documentation accurately. Mental Demand is relevant to activities involving data interpretation, validation of land-related information, coordination with communities and stakeholders, and alignment between field findings and administrative records. Effort reflects the combined mental and physical resources required to manage field mobility, mentoring activities, data processing, and report preparation within limited time frames.

Therefore, improvement recommendations should be formulated based on the dominant NASA-TLX dimensions. More realistic target setting and proportional task distribution are relevant to the Performance dimension, while simplified reporting formats and stronger technical support are relevant

to Mental Demand. Improved internal coordination and clearer task scheduling are relevant to Effort because they may help field staff manage simultaneous field and administrative responsibilities more effectively. Thus, the proposed recommendations are not general interventions, but dimension-based improvement directions derived from the perceived workload profile identified in this study. To clarify how the recommendations were derived from the NASA-TLX results, Table 8 links the dominant workload dimensions with specific Agrarian Reform Access tasks and corresponding improvement directions.

Table 8. NASA-TLX Dimensions, Related Tasks, and Improvement Recommendations

Dominant Dimension	Related Agrarian Reform Access Tasks	Interpretation	Recommended Improvement
Performance	Field verification, achievement of program targets, report submission, and data documentation.	Field staff perceived workload strongly in relation to target achievement and work quality expectations.	More realistic target setting, proportional task distribution, and clearer performance priorities.
Mental Demand	Land-related data validation, data processing, coordination with communities and stakeholders, and alignment of field findings with administrative records.	Field staff perceived cognitive processing, accuracy, and decision-making as prominent in handling field and administrative information.	Simplified reporting formats, technical guidance, and standardized data processing procedures.
Effort	Field mobility, mentoring, community assistance, coordination, and report preparation.	Field staff perceived considerable mental and physical effort in completing simultaneous field and administrative tasks.	Improved work scheduling, internal coordination, and task-sharing mechanisms.

4. Conclusion

Based on the findings, the perceived mental workload of field staff involved in Agrarian Reform Access activities at Kantor Pertanahan X was classified as high, with an average NASA-TLX score of 89.88. This result answers the first research objective by showing that field staff perceived substantial workload during the implementation of field verification, stakeholder coordination, data processing, community assistance, mentoring, and report preparation. The second research objective was addressed by identifying the dominant NASA-TLX dimensions, namely Performance, followed by Mental Demand and Effort. These dimensions indicate that the perceived workload profile was most prominently related to formal program target achievement, cognitive processing of field and administrative data, and the mental and physical effort required to complete interconnected field-based and administrative tasks. The third research objective was addressed through dimension-based improvement recommendations. More proportional task distribution and clearer performance priorities are relevant to the Performance dimension because field staff perceived workload strongly in relation to target achievement, work quality, field verification, and report completion. More structured work scheduling, improved internal coordination, and task-sharing mechanisms are relevant to the Effort dimension because they may help field staff manage simultaneous field mobility, mentoring activities, data processing, and reporting responsibilities. Meanwhile, simplified reporting formats, standardized data processing procedures, technical guidance, and enhanced technical support are relevant to the Mental Demand dimension because they may support field staff in handling land-related data validation, information processing, and alignment between field findings and administrative records. Therefore, the proposed recommendations are directly linked to the dominant NASA-TLX dimensions identified in this study and may support more effective implementation of Agrarian Reform Access activities. This study is limited by the small number of respondents and its focus on a single Kantor Pertanahan. Therefore, the findings should be interpreted as a contextual description of perceived mental workload among the observed field staff rather than as results that can be broadly generalized to all Agrarian

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Reform Access field staff. Future studies are recommended to involve larger and more diverse samples from several Kantor Pertanahan and to integrate NASA-TLX with complementary methods, such as interviews, observation, or task-based workload analysis, to obtain more representative workload patterns and stronger practical recommendations.

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